

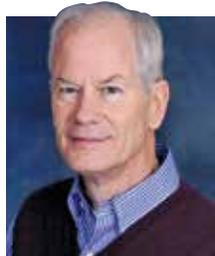


# Feeding calves is no easy formula

New survey data reveals traditional calf feeding programs are changing to meet the needs of modern calves.

by A.F. Kertz

**T**HE NAHMS (National Animal Health Monitoring System) reports have provided key information about U.S. dairy operations. The 2007 report added considerably more information on calves and heifers. The most recent 2014 report continued in that vein.



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There are a variety of liquid sources used to feed preweaned calves. Table 1 indicates that a smaller herd of less than 100 cows was more likely fed milk replacers whether medicated or not and fed largely unpasteurized waste milk if not feeding milk replacers. These smaller herds also were just as likely as large and medium-sized farms to feed a combination of milk plus milk replacer. There are a number of factors at play here.

There should not be enough waste milk on dairy farms to feed all calves, male and female. There may be enough at times to feed only female calves. Depending on how much waste milk is available to feed preweaned calves, milk replacer or an extender may be needed to make up the additional amount of liquid to feed these calves. How well that combination is mixed and fed is a subject for another day.

The more traditional 2 quarts twice daily feeding of milk or milk replacer has been changing. Sometimes this feeding level has been referred to as an “industry standard.” Rather than a standard, perhaps it is more correctly described as a practice or tradition. Yet, over one-half of small herds feed only 4 to 5 quarts daily, while this proportion has declined to about one-third for large herds. Another one-fourth of herds of any size fed 6 to 7 quarts daily — and more than 50 percent fed more than the traditional 4 quarts daily.

Just as there was a traditional 4 quarts of milk replacer fed daily to calves so, too, the “traditional” milk replacer had 20 percent protein and 20 percent fat — a 20/20. This was not based on nutritional needs but was more marketing driven. With the advent of studies over the last 15 years showing that calves should be fed more liquid, and with a higher than 20 percent protein content to avoid undue fattening, there still was a dogged 50 to 60 percent of operations not feeding more than 20 percent protein in milk replacers. Protein percent for nutritional purposes should be more within the 25 to 29 percent range. Greater adoption of this was present in larger herds.

## Finding the right amount of fat

While more protein is needed for greater growth rate as more milk replacer is fed, the story for fat inclusion is not as simple. For one thing, the traditional 20 percent fat in milk replacer was marketing driven. And it still is the most accepted level based on the data in Table 4. Greater fat percent can be beneficial in colder weather, but the downside is that higher fat levels limit starter intake.

A 2016 Penn State study published in a *Jour-*

*nal of Dairy Science* summarized nine calf trials. A very strong inverse relationship was found with higher dry matter intake from milk or milk replacer limiting starter dry matter intake. This inverse relationship accounted for about two-thirds of the variation in starter intake. So, the higher the fat percent and the more milk or milk replacer fed, the more it restricts starter intake. This likely translates into older weaning ages since starter intake needs time to improve before full weaning.

The catch is if starter intake is not adequate (2 pounds per day for a week) when calves are weaned, they will likely have a slump, be stressed, and be more likely to have respiratory problems.

## Smaller herds still wean later

In 2014, average age at weaning was 9 weeks versus 8 weeks in 2007. About one-third of operations weaned at 9 weeks of age, but 31 percent more were weaned beyond that age, while 35 percent weaned at an age younger than 9 weeks. This average age at weaning did not differ much among herd sizes except for herds less than 30 cows (37.4 percent of all herds) where the average age at weaning was 13 or more weeks. The other significant weaning ages on farms in 2014 were 18 percent at 7 weeks and 19 percent at 13 or more weeks — but this latter number was skewed by the smallest herds.

The main factors in how operations decided when to wean heifer calves were: 50.2 percent when calves reached the target weaning age; 21.6 percent when calves reached target weaning weight; 21.5 percent when calves consumed at least 2 pounds of starter for three consecutive days; and 4 percent were frank in acknowledging that they weaned calves when they needed the space for other preweaned calves! The data also begs two questions. How many operations weigh calves at this time? How many operations weigh daily starter consumption?

Weaning age is the simplest target and doesn't require weighing calves or starter intake.

The other starter related data I would have liked to have seen was the protein percent. In the U.S. and other countries, I continue to see 20 to 24 percent as-fed protein levels in starters. The average as-fed starter protein percent in one calf survey was about 20 percent as shared by me from a conversation with Jason Lombard of USDA APHIS VS.

If you use the 2001 Dairy NRC Young Calf Model, and input reasonable numbers for intake of milk/milk replacer and starter, 18 percent protein dry matter (about 16 percent as-fed) in the starter will meet protein needs. And I know of no substantive published data to refute that. Ironically, we are working hard to reduce percent protein in lactating cow diets to reduce nitrogen loss and feed costs while maintaining performance. So, why go the opposite direction with calf starter protein levels? 🐄

**Table 1. Liquid feed for preweaned calves**

Type of liquid	Small <100	Medium 100-500	Large >500	All
Nonmedicated MR	25.4	20.0	24.3	16.4
Medicated MR	55.1	49.2	33.5	37.6
Unpasteurized milk	67.0	44.2	26.3	55.7
Pasteurized milk	3.3	9.9	28.7	7.4
Milk + MR	10.9	18.9	20.2	14.4
Other	3.1	0.3	1.4	1.4

**Table 2. Quarts fed daily to preweaned calves**

Amount (quarts)	Small <100	Medium 100-500	Large >500	All
Less than 4	2.4	3.6	3.2	3.1
4 to 5	57.0	48.4	34.6	42.3
6 to 7	23.0	24.2	23.5	23.6
8 to 9	6.5	18.4	27.2	22.3
10 or more	5.7	5.4	11.5	8.6

**Table 3. Protein percentage in milk replacers**

Protein (%)	Small <100	Medium 100-500	Large >500	All
10 to 19	0.0	0.0	0.0	0.0
20	60.7	58.8	51.5	58.7
21 to 24	30.7	31.8	25.6	30.5
25 to 29	6.6	9.4	23.0	9.3
30 or more	1.9	0.0	0.0	1.0

**Table 4. Fat percentages in milk replacers**

Fat (%)	Small <100	Medium 100-500	Large >500	All
10 to 19	4.8	4.9	16.4	5.4
20	81.5	86.7	65.2	81.7
21 to 24	10.3	6.9	16.2	9.5
25 to 29	1.5	0.9	2.3	2.2
30 or more	1.9	0.5	0.0	1.2

